(c) REMARKS

The claims are 1, 3-30 and 34, with claims 1, 9, 23, 25 and 34 being independent. Claims 2 and 31-33 have been cancelled without prejudice or disclaimer. Claims 1, 11, 15, 16 and 34 have been amended to correct typographical errors. With respect to the change in claim 1, the Examiner's attention is directed to this claim as originally filed. No new matter has been added. Reconsideration of the claims is expressly requested.

The Examiner objected to claim 32 due to an informality. Since claim 32 has been cancelled, this objection is moot ans should be withdrawn.

The Examiner also objected to claims 20, 21 and 34 on the ground that an alternate expression was employed, i.e., "or" rather than the "and" term of a Markush claim. That objection is respectfully traversed.

M.P.E.P. § 2173.05(h) specifically sanctions alternative expressions in lieu of Markush language, and specifically states that "wherein R is A, B, C or D" shall also be considered proper. Therefore, the objection should be withdrawn.

Claims 1-30 and 34 were rejected as anticipated by EP 0 513 478 A2 (Ogi). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly review some of the key features and advantages of the presently claimed invention. That invention, in pertinent part, is related to a lead zirconate titanate-based thin film that has a chemical composition represented by the general formula Pb_{1-x} Ln_x $Zr_yTi_{1-y}O_3$ or Pb_{1-x} $Ln_xZr_{1-y}Ti_yO_3$. Ln in this structure is lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese or tin. In the above formulas, "x" can vary

from 0 to 1 and "y" can vary from 0.40 to 0.65, depending on a particular film orientation, structure and properties sought to be achieved. This film may be epitaxial (e.g., claims 1, 11, 23 and 25) and can also have an orientation that is {111}, or within 15° from {111}, with "y" being $0.43 \leq y \leq 0.65$ (see e.g., claims 1 and 25). Furthermore, as recited in claim 9, the relative permittivity-voltage characteristics of the film may satisfy the following equation: $\Delta\varepsilon/\Delta E \geq 3.0$ (ΔE is a change in relative permittivity and $\Delta\varepsilon$ is a change in electric field strength (kv/cm)). In addition, as recited in claim 34, at least any two of tetragonal, cubic or rhombohedral crystals may coexist in the film. As a result of the above features, the film has superior dielectric characteristics.

Ogi is directed to a ferroelectric PZT or PLZT film. However, contrary to the allegation made by the Examiner, Ogi does not disclose an epitaxial film as presently claimed. Specifically, Ogi merely teaches that preferential crystal orientation of its film may be (111). However, Applicants respectfully submit that this is not a disclosure of an epitaxial film as claimed.

As mentioned in the subject specification at page 14, line 27, through page 15, line 2, an epitaxial crystal is a crystal in which crystal grains are oriented in the same direction in all the crystalline regions (see, e.g., Fig. 1, left hand structure). As a result, XRD patterns of epitaxial films have peaks substantially attributed only to a single orientation, which is demonstrated by Fig. 6. As can be seen in the figures in Ogi, each of the XRD patterns shows peaks attributed to at least two different orientations, including (100) and/or (200), even when the (111) orientation is preferential. Clearly, Ogi fails to disclose an epitaxial film as presently claimed and also fails to disclose the specific orientation of such film as claimed.

Furthermore, Applicants respectfully submit that Ogi fails to teach a film in which a ratio of a change in relative permittivity and a change in electric field strength ($\Delta\varepsilon/\Delta E$) is at least 3. As discussed in the specification at page 21, line 19, through page 22, line 22, line 13; page 39, line 21, through page 22, line 10; and page 39, lines 1-10, and shown in Figs. 9-13, this ratio and permittivity-voltage characteristics in general are related to the orientation of the film. In particular, in conventional (100) PZT films, even when "y" is 0.48, $\Delta\varepsilon/\Delta E$ is 2.5 at best, which is further substantiated by Fig. 11.

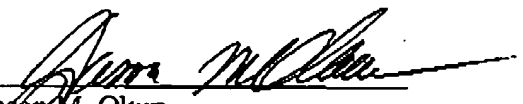
To the contrary, the presently claimed film, due to its orientation and structure, has a ratio $\Delta\varepsilon/\Delta E$ that can be substantially greater than 3. Such film is not disclosed in Ogi, and the Examiner's allegation of inherent disclosure in Ogi cannot be supported (see specification page 39, lines 1-10). Applicants respectfully submit that Ogi teaches conventional films, which are demonstrated as being inferior in Fig. 11 in the subject application.

Also, Applicants respectfully submit that Ogi fails to teach a film in which the orientation is {111} (or within 15° of {111}) and in which at least any two of tetragonal, cubic or rhombohedral crystals coexist. As mentioned above, based on the disclosure and figures in Ogi, all its films appear to have at least one of the (100) and (200) orientations. Furthermore, no explicit or inherent disclosure regarding the morphology of the crystals is understood to be provided.

Wherefore, Applicants respectfully submit that the present claims are patentable over Ogi and request withdrawal of the outstanding art rejection and expedient passage of the application to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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